UCL
Rapa Nui Landscapes of Construction Project

LOC17

Were the *moai* along Rapa Nui's *Ara Moai* (*moai* roads) standing?

*The LOC "*moai *roads" survey,*

2010–2017

UCL Rapa Nui Landscapes of Construction

The Rapa Nui Landscapes of Construction Project (LOC) is based at the University College London Institute of Archeology, and is directed by Professor Sue Hamilton, of the UCL Institute of Archaeology, in collaboration with Dr Felipe Armstrong, of the Museo Chileno de Arte Precolombino, and Tiki Astete, Rapanui researcher. Fieldwork is supervised by Mike Seager Thomas, also of the UCL Institute of Archaeology.

On the island, LOC works with Rapanui elders and students and in close cooperation with the *Corporacion National Forestal*, Rapa Nui (CONAF), the *Ma'u Henua* indigenous community organisation, the *Museo Antropológico P. Sebastián Englert and STP* Rapa Nui.

The main aim of the project is to investigate the construction activities associated with the island's famous prehistoric statues and architecture as an integrated whole. These construction activities, which include the quarrying, moving and setting up of the statues are considered in terms of island-wide resources, social organization and ideology.

LOC is not just concerned with reconstructing the past of the island, but is also actively contributing to the "living archaeology" of the present-day community, for whom the former is an integral part of its identity. It is working with the Rapanui community to provide training and help in recording, investigating and conserving its remarkable archaeological past.

Between 2010 and 2017, the survey team working on the LOC *Ara Moai* survey included Cristopher Ahsoun Tuki, Felipe Armstrong, Tikitehatu Astete Paoa, Elizabeth Baquedano, Karina Croucher, Moana Gorman Edwards, Sue Hamilton, Julio Haoa Avaka, Aly Keir, Francisca Pakomio, Tamsin Parish, Mike Seager Thomas, Lawrence Shaw, Adam Stanford, Charlene Steele, Alejandro Tucki Castro, Christian Veri Veri, Kate Welham & Ruth Whitehouse.

The present report was prepared by Mike Seager Thomas. The views expressed in it are his and are not necessarily representative of those of other team members, and any complaints about it and them should be directed to him.

2023

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Were the *moai* along Rapa Nui’s *Ara Moai* (*moai* roads) standing?

The LOC “moai roads” survey, 2010–2017

text by Mike Seager Thomas

Rapa Nui’s *Ara Moai* (statue roads) consist of a number of bifurcating alignments of recumbent *moai*, in places associated with discontinuous linear hollows and lynchet-like features, leading to (or away from) the Rano Raraku *moai* quarry, to which almost all—if standing—would have had their backs. The *moai* demarcating these “roads”, like most on the Island, are of a distinct volcanic tuff of a grey-green or ochre colour obtainable only at Rano Raraku and are characterised typologically by their wedged eyes, which are the same as those of *moai* at the quarry but different from those of *moai* at coastal *ahu* (ceremonial platforms), which consist of lenticular hollows (Fig. 1), held to be the sockets for carved coral and stone eyes (e.g. Heyerdahl 1975, 163; Martinsson-Wallin 1996, 41)

The *Ara Moai* were first recognised and mapped by the Routledge team in 1914/15, a member of the team having spotted them on the ground from a small hill, most likely Mauŋa Toa Toa, just west of Rano Raraku Routledge 1919, fig. 74). The Routledge team also excavated two or three of the *moai* (*ibid*. 1919, 194–97). Since then, small excavations have been conducted both on the “road” itself (Love 2001) and around a few more “road” *moai* (Cauwe 2011, 37–38; Heyerdahl *et al.* 1989; C. Cristino & P. Vargas pers. comm.), and Routledge’s original map elaborated using satellite photography and surface survey (Lipo & Hunt 2005) (Figs 2 & 3). Mapping of archaeological features in the vicinity of the *Ara Moai* has also been carried out (Cristino *et al*. 1981), but this was carried out without the benefit of GPS, and the identification of the features plotted, as opposed to their locations, remains unavailable.

Till recently there have been two alternative interpretations of the *Ara Moai* and the *moai* demarcating it.

The first, proposed by Routledge (1919, 196) and acknowledged as a possibility by Jo-Anne Van Tilburg (1994, 154), is that they were avenues along which *moai* were deliberately aligned. The evidence for this was: their similar orientation, away from Rano Raraku; traces of pits in, and a foundation upon which they apparently once stood (Cauwe 2011, 37–8; Heyerdahl *et al.* 1989; Routledge 1919, 96); the breakage pattern of the *moai*, which has been attributed to their falling from a standing position (Heyerdahl *et al.* 1989; Routledge 1919, fig. 76); the weathering on the back of one, which Routledge believed could not have occurred unless it had been standing (Routledge

1919, 195); and a description in Captain James Cook's report of his visit to the island of a large isolated, but standing *moai* (Cook 2007 [1777], 176).

The second, favoured by the Heyerdahl team and Alfred Métraux (Métraux 1957, 156–57; Skjölsvold 1961, 378–79; Heyerdahl *et al*. 1989, 57) as well more recent workers (Flenley & Bahn 2002; Lipo *et al*. 2013; Love 2001; C. Cristino & P. Vargas pers. comm.), is founded in Island legends that the *Ara Moai* led from the quarry to the *ahu* and that the *moai* along it were halted, or fell by the way, on route to the *ahu* at which they were intended to be set up. In this the *moai* were either "walked" upright (Lipo *et al*. 2013), as suggested by legend, or dragged in a recumbent position (Van Tilburg 1994, chapter 10); and were either abandoned one by one, a view consistent with current understandings of Polynesian sacred industry, which hold that projects could

Figure 1

Moai *eyes. An* ahu-*type* moai *(right) and a Rano Raraku/*Ara Moai-*type* moai *(left) (photos: MST & Adam Stanford, Aerial Cam)*

be abandoned at any time as a result of ritual errors (Handy 1971 [1927], 286–87; cf. Seager Thomas 2014), or at the same time.

The evidence for these latter views is mostly inferential. If statues were moved, and they were, there must have been roads; and if quarrying stopped suddenly, which is not certain, so must transport. However, the *possibility* that *moai* were walked rather than dragged then abandoned in transit, has provided a plausible alternative explanation for much of the hard evidence cited in favour of the *moai* alignment hypothesis. To this can be added their *apparently* random distribution, the fact that all appear to have been carved to the base, and were probably not destined to be set up in pits (*contra* Routledge

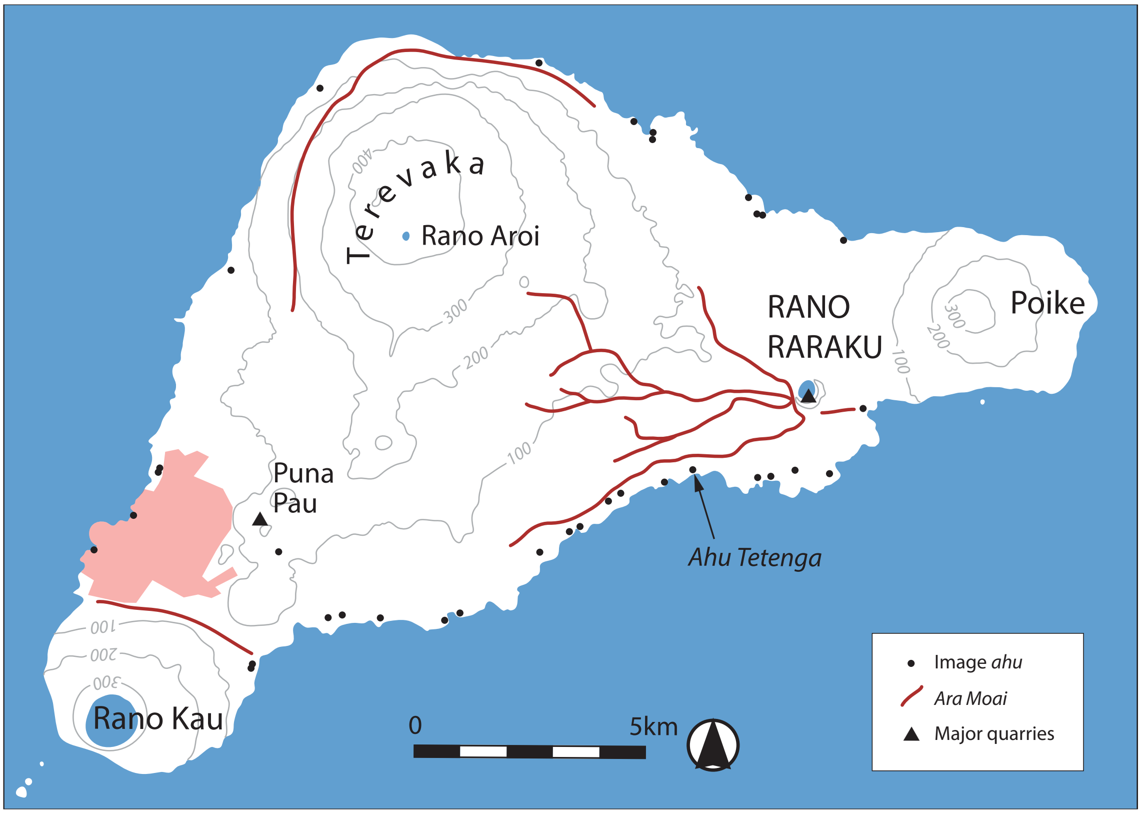

Figure 2

Map of possible Ara Moai *(after Lipo & Hunt 2005) (drawing: MST)*

Figure 3

Vegetation mark adjacent to AMM011 showing the Ara Moai *middle (photo: Google Earth)*

1919, 196; Skjölsvold 1961, 378–9), a plausible alternative explanation for the excavated pits (Lipo *et al*. 2013, 2861), the likelihood that one *moai,* which today protrudes from a pit on the line of the *Ara Moai*—LOC's *moai* AMS122—has the wrong kind of eyes for a "road" *moai*, and damage to their bases, which *might* be indicative of upright transport (*ibid*.).

These alternative interpretations are important because they support, or are more or less consistent with two quite different views of Rapa Nui prehistory—the first that Rano Raraku and quarrying, in addition to the *moai* that they yielded, were considered special and ritualised; the second, that Rapa Nui society succumbed to an ecological catastrophe, which resulted in the sudden cessation of *moai* quarrying, transport and erection.

Owing to a pre-existing interest in these issues (see LOC 2010), the UCL/University of Manchester Rapa Nui Landscapes of Construction Project (LOC) was invited by the *Corporacion National Forestal* (CONAF), which at the time managed most of Rapa Nui's archaeological monuments, to incorporate into its programme of fieldwork a survey of the *Ara Moai* south, the *Ara Moai*'s longest branch, in advance of the creation of a heritage trekking trail along this. Initially, our work focused on the *Ara Moai* south between Rano Raraku and Ahu Hoa Aŋa Vaka A Tua Poi (Fig. 4) (LOC 2013; 2014). This involved mapping—using GPS—and characterising the visible archaeological features associated with the *Ara Moai*, conducting geophysical survey across it and in the vicinity of the recumbent *moai*, landscape and phenomenological surveys and a detailed conservation survey of the *moai*, similar to one conducted by CONAF on *moai* at Rano Raraku (CONAF 2012), to assess their condition and any threats to them. A key aim for LOC was the identification of any previously unregistered evidence that would support or refute the existing alternative interpretations of the *Ara Moai* and the statues demarcating it.

During this survey LOC noticed and began systematically to record the differential weathering of the *downward sides* of prone (and the *upward side* of one supine) *moai*, and specifically that of parts that would have been protected from, and parts that would have been exposed to, the elements had the *moai* once been standing (LOC 2013, 24; LOC 2014, 25–27). With CONAF's permission, this latter work was then extended to a sample of upstanding and prone *moai* at Rano Raraku and of prone and supine *moai* on the *Ara Moai* north, which provided a control for our observations on the *Ara Moai* south (LOC 2014; 2015). We also looked at a number of "road" *moai* outside the area of the island then managed by CONAF (Table 1; Appxs 2 & 3). Around the same time, unknown to LOC and the local archaeological establishment (CONAF, the *Museo Antropológico Sebastián Englert* etc.) (F. Torres H. pers. comm.), a team from Belgium was quietly following up Routledge's observations on weathering on the *upward sides* of *moai* (Cauwe & De Dapper 2015).

This essay considers LOC's work on *moai* weathering, and summarises the results of the associated geophysical and landscape/phenomenological surveys conducted by it. It also touches on the *Ara Moai*'s relationship to the local archaeological landscape as a whole. LOC's work has contributed to our understanding of the *Ara Moai* in important ways. Prior to the commencement of the wider surface survey of the *Ara Moai* south, resistivity survey was conducted at the bases of 13 *moai*, nine of which registered anomalies, two interpretable as possible pits, and the rest as possible platforms (LOC 2010). LOC's weathering survey has proved without doubt that at least 19 of the 33 "road" *moai* examined by it were formerly standing. The results of the landscape/phenomenological survey challenge (though do not actually

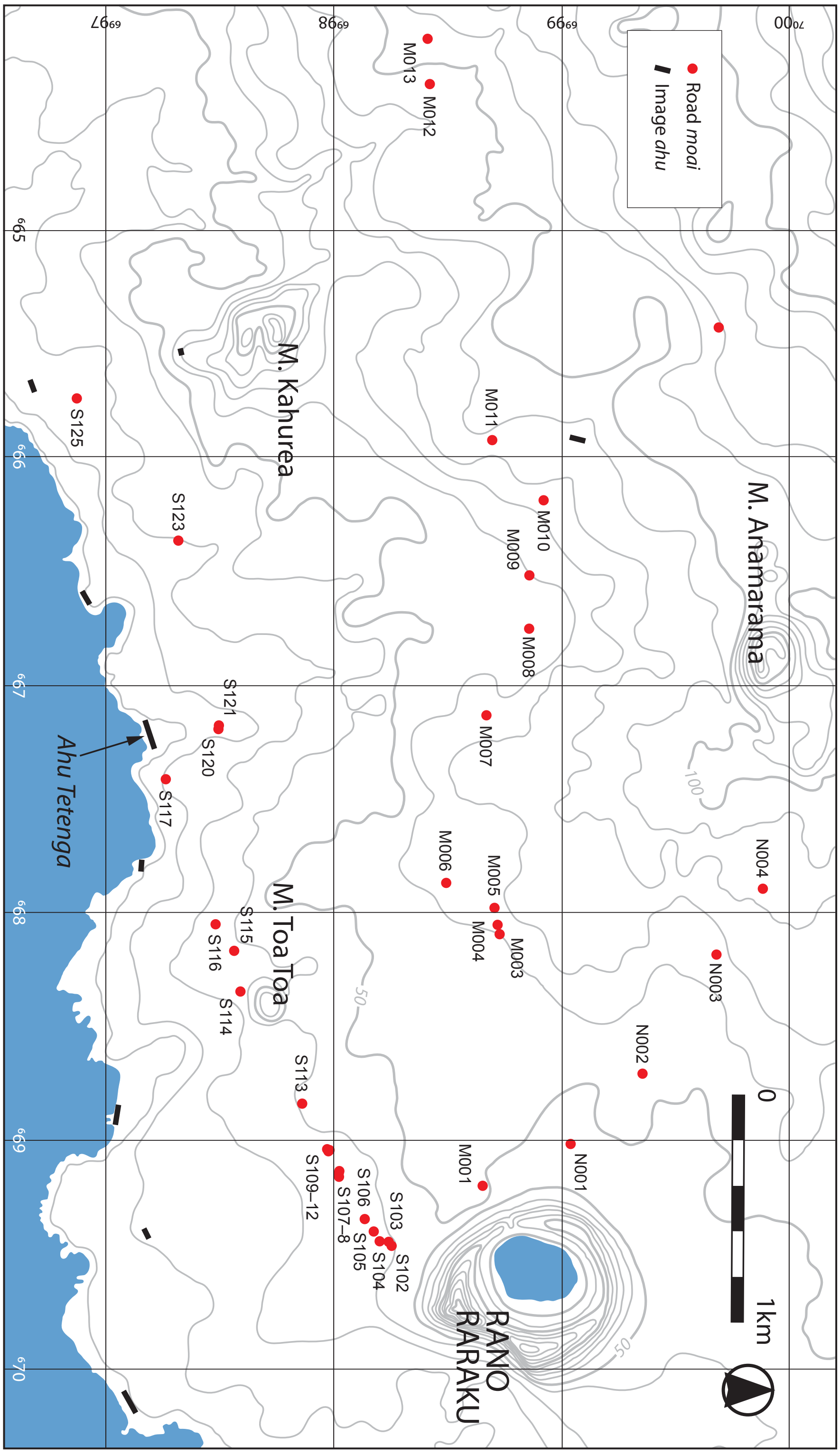

Figure 4

Map of "road" moai *surveyed by LOC along the* Ara Moai *south (AMS102–117, AMS121–120 and AMS123 and 125, the* Ara Moai *middle (AMM001, AMM05 and AMM09–13, and the* Ara Moai *northwest, AMN001–AMN004) (drawing: MST)*

disprove) the theory that the distribution of *moai* along the *Ara Moai* south was "random", and suggest instead that their positioning was deliberate, while the feature survey placed it in a wider archaeological context. It failed, however, to find any evidence for a continuous roadway.

Moai weathering along the *Ara Moai* and at Rano Raraku

The weathering of Rano Raraku tuff

Rano Raraku tuff is a sedimentary volcanic rock comprising partially fused, partially cemented scoriaceous tephra (see Baker 1998: 282; Charola 1997: 20; Gioncada *et al*. 2010: 860–63). Its most obvious features are its ochre or grey-green colour and its (mostly) granular texture. It is not an homogeneous rock. Different facies of it comprise layers of different thickness, and incorporate different fractions and sizes of scoriaceous and other stone inclusions (e.g. Fig. A3.60). In the field, a dark patina caused by surface algae turns the stone a dark grey brown (Charola 1997, 24) (Appx A4.3), and it can be difficult to distinguish the different facies. Its most important property was workability. Tough enough to withstand carving and transport within and out of the quarry, it is also relatively lightweight, and extractable in bigger pieces than any other rock available on the island. It appears to have been reserved for carving into *moai*, which were only later incorporated —whole or broken—into *ahu*, burials and other structures. This can perhaps be attributed to its yellow colour, which like red was considered potent by some early Polynesians. Visually similar but unworkable tuff is known from Mauŋa Toa Toa and the upper northern flanks of Mauŋa Terevaka.

Apart from man, the principal threat to *moai* carved in Rano Raraku tuff is water. This dissolves the glass in the tephra, so that the tuff disaggregates, an effect exacerbated by the differential expansion and contraction of the minerals comprising it, when subject to heat or cold, the swelling when wetted of clays formed within it, and pressures caused by the build-up of absorbed salt and the rooting of plants. The tuff crumbles, cracks, and superficial layers flake off (Fig. 5.6). The dissolved glass is re-deposited as a white siliceous crust where the water drains out of the stone and evaporates (*ibid*., 23) (Fig. 5.4). Because of differences in their compositions, these processes advance at different rates in different beds within the rock. The result is a weak rock, with a corrugated surface (Fig. 5.1) down which water flows, mechanically abrading it, or in which it pools (Fig. 5.2), and an increase in the surface area subject to weathering. Other significant threats include wind sand-blasting and animal damage (horses like to rub their bottoms on the sharp edges of *moai*) (Fig. 5.3).

Previous and concurrent work on moai *weathering*

The work of the Belgium team enlarges upon Katherine Routledge's observation "that on one [*moai*] the lines of weathering could not have been made with the figure in its present horizontal attitude. The rain had evidently collected on the head and run down the back; it must therefore have stood for a long time in a vertical position" (Routledge 1919, 195). This view is based upon a belief that the principal agent in *moai* weathering is *physical* erosion by water, and that this manifests itself in the corrugations referred to above. The Belgium team observed these to continue across breaks in the *moai*, the implication being that they developed prior to breakage, asserted

Figure 5

Aspects of moai *weathering along the* Ara Moai *south. 1) the "corrugated" back of a prone* moai*—the more resistant layers stand prond of its deeply weathered back, 2) water puddling on back of a prone* moai*, 3) animal-rubbed tuff, 4) reprecipitated silica on the chest of a prone* moai*, 5) lichen growth, 6) cracking (arrowed) and laminating Rano Raraku tuff. Scales 10cm (photos: Adam Stanford, Arial Cam, top left; MST, top right, middle and bottom)*

that they "widen consistently towards the base", and noted, apparently superimposed upon them, an active network of *smaller* water runoff runnels, the direction of which they believed reflects the positions of the *moai* today. From these observations, the Belgians inferred, like us, that the *moai* were once standing, but also that they had been standing for longer than they have been lying down (Cauwe & De Dapper 2015, 21–3). They did not observe the relationship between the bedding of the tuff, which is variously orientated in different *moai*, not just longitudinally (Charola 1997, 20) (Appx 3), and the "direction" of weathering; they did not observe that along the *Ara Moai* prone *and* supine (e.g. AMS123) *moai* alike are more heavily weathered on their upward than their downward sides, which suggests both that this occurred when they were lying down, and that they had been lying down for longer than they had been standing up; and they did not observe—or ignored the implications of—the differential weathering on the fronts of *moai* discussed here.

The study of *moai* weathering and condition is of course hardly new ground. Elena Charola in particular usefully details the nature and implications of the human and natural weathering process to which *moai* were and are now exposed (Charola 1997), and CONAF has attempted to quantify these for 51 *moai* at Rano Raraku (CONAF 2012). Useful comments on weathering and particularly breakage can also be found in several *moai* databases (e.g. Shepardson 2003), and frequent reference is made to it in excavation and survey reports (e.g. Mulloy 1997 [1973], 56). But so far, to the best of our knowledge, only Routledge, the Belgian team and ourselves have attempted to use it interpretatively.

The LOC Ara Moai *weathering survey*

For LOC's *moai* survey two recording sheets were designed: a *Moai* Conservation Record sheet, on which we recorded the location and severity of the different manifestations of weathering referred to above (LOC 2014, appx 4), and a Weathering on the Fronts of *Moai* Record sheet (Appx 1). Only the Weathering on the Fronts of *Moai* Record sheet concerns us here. This records the position of the *moai*, and for the right and left front, the degree of weathering of the upper eye, the lower eye/cheek, the lower chin and neck, the chest and the lower stomach/hands. Where visible the forehead and lower nose were also looked at, though data on these are not presented here. In all cases the degree of weathering was assessed as: not visible (n/v), light (L), moderate (M) or heavy (H) (Table 1).

In all 35 *moai* along the *Ara Moai* were recorded in detail, 33 with wedged eyes of the sort found at Rano Raraku and associated with the *Ara Moai*, for which both *Moai* Conservation Record sheet and Weathering on the Fronts of *Moai* Record sheet were completed, and two with eyes consisting of lenticular hollows of the sort associated with *ahu* (Appx 2), for which only the *Moai* Conservation Record sheet was completed.

Of the 33 *moai* with wedged eyes that were recorded, 21 were on the *Ara Moai* south (17 prone and four supine), four on the *Ara Moai* north (two prone, one supine and one on its side), seven on the *Ara Moai* middle (five prone and two supine), and one on a possible continuation of the *Ara Moai* north at Vai Mata on the northwest coast. In addition, we looked at individual prone *moai* with wedged eyes at Rano Raraku, at two inland *ahu*, Ahu Ava Raŋa Uka A Toroke Hau, which faces northwest and Ahu Mata Ketu, which faces west,

Moai no	Position	Breakage	Weathering											
			right side						left side					
			upper eye	lower eye/ cheek	lower chin/ neck	chest	stomach/ hands	DWI	upper eye	lower eye/ cheek	lower chin/ neck	chest	stomach/ hands	DWI
AMS102	prone	at neck	n/v	L	n/v	n/v	L	-1	n/v	n/v	n/v	n/v	n/v	none
AMS103	prone	intact	L	M	M	H	M	2	L	L–M	M	M	L–M	0
AMS104	prone	intact	L–M	M	M	H	L	2	M	M	L	H	M	2
AMS105	prone	intact	L	M	L–M	H	M–H	4	L	L or L–M	L	M	M	0
AMS106	prone	intact	n/v	n/v	n/v	n/v	n/v	none	L	L	L	L–M	L–M	-2
AMS107	prone	across face	L	L	L	L	L	-4	n/v	n/v	L–M	L	L	-2
AMS108	prone	intact	L	M–H	M–H	H	n/v	1	L	M	L	M	L	4
AMS109	prone	intact	L	M–H	M	H	M	4	L	M	M	H	M	2
AMS110	supine	across lower face and at neck; chin detached but in situ	H	H	H	H	H	-4	H	H	H	H	H	-4
AMS111	prone	across lower face and below shoulders	L	M	M	H	M	2	n/v	n/v	L–M	M	M	0
AMS112	supine	broken across shoulders	VH	VH	VH	VH	VH	-4	VH	VH	VH	VH	VH	-4
AMS113	prone	broken across lower face	n/v	n/v	L	M–H	M	2	n/v	n/v	L	M	L	2
AMS114	prone	broken across lower face	L	M	M	H	M	2	L	L–M	L	M–H	M	4
AMS115	supine	across eyes, at chin and below shoulders	H	H	H	H	H	-4	H	H	H	H	H	-4
AMS116	prone	intact	M	M–H	M	M	M	0	M	M–H	L–M	M	M	2
AMS117	prone	intact	L	L	M	M	M	-2	L	M	M	M	M	-2
AMS120	prone	intact	M	H	n/v	H	n/v	1	L	H	M	H	M	4
AMS121	prone	across lower face	n/v	n/v	M	H	n/v	1	M	H	M	H	n/v	3
AMS123	supine	intact	H	VH	M	H	H	2	M–H	H	M	H	H	2
AMS125	prone	across lower face and below shoulders	n/v	n/v	M	H	n/v	1	L	M	L & M	H	M	4
AMS244	prone	across lower face and below shoulders	M	H	L	H	H	2	L	H	L	H	M	4
AMM001 RR-149	prone	intact	L	H	L	M	L–M	4	L	L–M	L	M–H	M	4
AMM005	prone	intact	L–M	H	L	H	n/v	3	n/v	n/v	L	M	M	0
AMM009	prone	intact	L	L	n/v	L	n/v	-1	L	L-M	n/v	n/v	n/v	1
AMM010	prone	intact	L	L	L–M	L	n/v	-2	n/v	n/v	n/v	n/v	n/v	none
AMM011	supine	intact	H	H	H	H	H	-4	H	H	H	H	H	-4
AMM012	prone	intact	L	L–M	L–M	L–M	L–M	-2	n/v	n/v	n/v	n/v	n/v	none
AMN013	supine	intact	VH	VH	VH	VH	VH	-4	VH	VH	VH	VH	VH	-4
AMN001	prone	intact	M	M	n/v	M–H	n/v	-1	M	H	n/v	n/v	n/v	1
AMN002	on side	intact	n/v	n/v	n/v	n/v	n/v	none	L	M	L–M	M	M–H	2
AMN003	prone	at neck	L	L	L–M	L–M	L–M	-2	n/v	n/v	L	L–M	n/v	1
AMN004	supine	across upper face and chest; nose detached but in situ	VH	VH	VH	VH	VH	-4	VH	VH	VH	VH	VH	-4

Table 1

Moai *weathering. Grey=the more weathered side; DWI=weathering index (p. 11)*

Moai no	Position	Breakage	Weathering											
			right side						left side					
			upper eye	lower eye/ cheek	lower chin/ neck	chest	stomach/ hands	DWI	upper eye	lower eye/ cheek	lower chin/ neck	chest	stomach/ hands	DWI
32-997 (?AMN)	prone	intact	L–M	H	L–M	M–H	M–H	0	L	H	L–M	L–M	L–M	0
Pui	supine	intact	H	H	H	H	H	-4	H	H	H	H	H	-4
RR-043	standing	intact	L	M	n/v	n/v	n/v	1	M	M	M	n/v	n/v	-2
RR-049	standing	intact	M	M	L	L	n/v	-1	L	M	L	L	n/v	1
RR-050	standing	intact	L–M	M	L–M	L–M	n/v	1	L	M	M	M (e)	n/v	1
RR-051	standing	intact	L	M	L	M	n/v	3	L	M	L	M	n/v	3
RR-055	standing	intact	L	M	L	M	n/v	3	L	M	M	M	n/v	-1
RR-063	standing	intact	L	M	L	n/v	n/v	2	L	M	L	n/v	n/v	2
RR-066	prone	intact	L	M	L	n/v	n/v	2	L	L	L	L	n/v	-3
RR-077	standing	intact	L	M	L	M	n/v	3	L	M	L	M	n/v	3
RR-079	standing	intact	L	M	L–M	M	n/v	3	L	M	L–M	L–M	n/v	1
RR-086	standing	intact	L	M	L	M	n/v	3	L	M	L	M	n/v	3
RR-089	standing	intact	M	M	L	M	n/v	1	L	L	L	L	n/v	-3
RR-098	standing	intact	L	M–H	L–M	M–H	n/v	3	L	L–M	L	M	n/v	3
17-999	prone	intact	n/v	n/v	L–M	L–M	L–M	-2	L–M	M	M	M	L–M	0
05-217	prone	broken across shoulders	L	L–M	L–M	H	M	2	n/v	n/v	n/v	M–H	M	1

Table 1 cont.

Moai *weathering. Grey=the more weathered side; DWI=weathering index*

and at an isolated supine *moai* with wedged eyes located beneath Mauŋa Pui (Table 1), possibly associated with a northern branch of the *Ara Moai* middle.

In order to check whether the inference that differential weathering profiles observed on the lower surfaces of recumbent *moai* along the *Ara Moai* had developed while these were standing held good for *moai* that were in fact standing, Weathering on the Fronts of *Moai* Record sheets were also completed for 11 standing *moai* on the exterior flanks of Rano Raraku (Table 1).

The locations of these *moai* and the code numbers given to them by us and other workers can be found in Appendix 2. *All* are shown in Appendix 3.

During this assessment we were faced with three major difficulties. The first of these is visibility. Parts of *moai* are buried, obscured by vegetation, or, because of their height or shape, difficult to see. Very likely it was vegetation cover that prevented the Belgian team from spotting the pronounced difference between the weathering of the upward and downward sides of *moai* and the differences in frontal weathering recorded here. We were assisted here by CONAF, which cleared the vegetation from around 16 of the 17 *moai* between Rano Raraku and Ahu Haŋa Teteŋa.

The second is the inviolability of *moai*. Because of this we had to rely upon purely visual assessment. This is a blunt instrument. The survey team could agree on the difference between light, moderate and heavy weathering, for example, but greater subtlety was difficult to achieve and impossible to express in a way that would allow others to assess and use our work. For the *Moai* Conservation survey, we solved the problem by taking multiple high-resolution photographs, which can be used for direct visual comparison, both with other *moai* and photographs of the same *moai* taken in the future, and

for the Weathering on the Fronts of *Moai* survey, by noting *relative* differences between the weathering of parts of individual *moai*. This is the differential weathering index (DWI) on Table 1. For each side of the *moai*, differences in the weathering of adjacent unprotected and protected areas were scored: 1 for a protected area that was less weathered than an adjacent unprotected area, and -1 for a protected area, the weathering of which was the same as or heavier than that of an adjacent unprotected area. A total score of 0 or higher indicated a marked difference in the weathering of adjacent protected and unprotected areas; a total score below 0 indicated no difference in the weathering of adjacent protected and unprotected areas.

The last is the difference in the resistance to weathering of different facies of Rano Raraku tuff, in the conditions where the *moai* were set up/abandoned (e.g. exposed, in the lee of a hill as at Rano Raraku, by the sea), and related to the orientation of the bedding within them. Using the DWI, we could infer that one *moai* was more or less weathered than another, but very often we could only speculate why.

Results

All of the *moai* along the Rano Raraku–Ahu Hoa Aŋa Vaka A Tua Poi section of the *Ara Moai* are open to the elements and subject to on-going climate related chemical and physical weathering. It is worth noting, however, that the condition of *moai* S107 and S123, which were photographed by the Routledge team (Routledge 1919, figs 75 & 76), have not deteriorated noticeably in a hundred years (Fig. 6). All have been rubbed up against by animals. The most common weathering feature is corrugation, caused by the differential weathering of the layers comprising the tuff, and it is associated with the greatest loss of features. Exposure to sedimentation and marine spray do not appear to be particularly problematic, even on those *moai* closest to the sea (S117, S120 and S121). Potentially destructive lichen growth is widespread and the downward sides of almost all have white silica deposits, which for prone statues can obscure delicate but otherwise well-preserved features such as the hands (Fig. 5).

Of the 33 recumbent road *moai* with wedged eyes now examined on the *Ara Moai*, 19 (18 prone *moai*, one supine *moai* and one *moai* on its side) show *unequivocal* evidence in the form of differential weathering on their fronts that they had formerly been standing. The un- or less weathered parts are the upper eye and the lower chin/neck and the stomach, which are mostly lightly or moderately weathered. The more weathered parts, the lower eye/face and the chest, are mostly moderately or heavily weathered (Fig. 7; Appx 3; Table 1). Of these 19 *moai*, 14 are more heavily weathered on the right side and only six, more heavily weathered on the left (Table 1), an observation consistent with the view that they were facing down the road away from Rano Raraku with their right fronts towards the prevailing winter north and north-westerly winds (Flenley and Bahn 2003, 16–18; Flenley *et al*. 1991, 87). The same trend of difference was seen on five of the 12 *moai* examined at Rano Raraku (Fig. 8; Table 1). Despite the fact that 11 remain standing, the weathering of most of these—back and front—is less pronounced than that on the fronts of those examined along the route of the *Ara Moai*, with none of those examined falling into the heavily weathered category. Nonetheless the evidence is clear. On a standing *moai*, those parts of it that are vertical or face upwards are more heavily weathered than those that face downwards. Of the two *moai* with wedged eyes, which stood on inland *ahu*, that at westward

Figure 6

Moai *AMS107 photographed during the Routledge expedition and in 2013 (photos: the Routledge expedition, top, & bottom, MST)*

facing Ahu Mata Ketu displayed the same trend (Fig. A3.70), while that at Ahu Ava Raŋa Uka A Toroke Hau, which faces northwest, showed no difference on its right hand side but a slight difference on its left (Fig. A3.68). No difference in weathering was observed on the supine *moai* located under Mauŋa Pui.

Prone *moai* weathered more on their left than their right sides, such as AMM09, which points directly Mauŋa Pui, might have been oriented in a different, more northerly direction, than the other surveyed *moai*. Prone *moai*

along the *Ara Moai*, which display little or no weathering on their fronts (3–4) (Table 1), *might* have been the earliest to fall or be laid down.

Geophysical evidence for platforms and pits at the bases of recumbent *moai*

Prompted by Routledge's pit excavation (Routledge 1919, 196) and Heyerdahl *et al*.'s of a stone "platform" (Heyerdahl *et al*. 1989) associated with *moai* on the *Ara Moai*, LOC conducted resistivity surveys to the rear of 13 of these, 11 on the *Ara Moai* south (LOC 2010; 2015, appx 5; Richards *et al*. 2011, 203, fig. 3) and two on the *Ara Moai* north (Table 2). More extensive resistivity, electromagnetic and fluxgate gradiometer (magnetometry) surveys were conducted across selected sections of the *Ara Moai* south. Of the resistivity surveys conducted to the rear of *moai*, nine registered anomalies immediately behind the *moai*, two of low resistance, interpretable as possible pits analogous to pits excavated by Cauwe (2011, 37–8) and Routledge (1919, 196), and the rest of high resistance (Fig. 9), interpretable as possible platforms analogous to that excavated by the Heyerdahl team (Heyerdahl *et al*. 1989). Owing to the possibility of other interpretations of such anomalies—excavations, variations in the depth of the natural near surface geology, prehistoric garden features, animal scuffs, compaction etc.—these observations prove nothing by themselves, but they are consistent with what would be expected from resistivity survey in these locations had the *moai* along the *Ara Moai* formerly been standing.

The wider geophysical survey revealed nothing of the road that was not visible on the surface, but it did confirm the variable depth of the near surface geology in the vicinity of some of the recumbent *moai* discussed here (e.g. AMS114 and AMS125) (LOC 2013, chapter 7; 2014, appx 3; 2014, appx 5).

Landscape and phenomenological survey

Previous observations on moai *position along the* Ara Moai

The position and orientation of the *moai* along the *Ara Moai* have been used in arguments both for and against Routledge's, the Belgians team's and LOC's belief that the *moai* along it were deliberately set up there.

Routledge herself observed that on two *Ara Moai*, the *moai* "grow further apart as the distance from the mountain [Rano Raraku] increases" (Routledge 1919, 194). Subsequent writers, by contrast, have asserted that their distribution is disorderly (Métraux 1957, 157) or casual (Skjölsvold 1961, 379), from which they have inferred that they were abandoned in transit. These two observations are obviously at odds with each other. Routledge also noted that prone *moai* along them have their heads away from Rano Raraku (Fig. 10) and that supine *moai* have their heads towards it (*ibid*., 196). In fact, few are *exactly* on line with it and some cannot be assessed, but overall the trend holds good—if stood up, *most* would have their backs to the quarry. A local informant has pointed out to us in addition that the "first" *moai* on each *Ara Moai* is like a signpost, and points along it (Edmundo Pont pers. comm.).

The trouble with these observations is, firstly, that though consistent with a particular interpretation, they prove nothing by themselves, because

they are also consistent with other interpretations; and secondly, that the observations themselves are unsystematic (and in the case of the spacing of *moai* along it, not wholly true for all *Ara Moai* and all *moai* along these).

Figure 8
Moai RR-098 (Piro Piro) at Rano Raraku. It is more weathered on its right than its left-hand side, and its forehead, lower eyes/cheeks, upper nose, upper chin and chest are more heavily weathered than its upper eyes, lower nose and lower chin/neck (photo: MST)

Much sounder archaeologically is Lipo *et al*.'s observation that where the *Ara Moai* slopes downhill, away from Rano Raraku, most *moai* lie facedown, and where it slopes uphill away from Rano Raraku, most lie on their backs, but although consistent with and used in support of their theory that the *moai* along the *Ara Moai* fell while being transported in a standing position (Lipo *et al*. 2013, 2861), it is also what would be expected of *moai* that had been erected on it and subsequently fell or were pushed over.

The LOC survey

The aim of LOC's survey of *moai* location and orientation along the *Ara Moai* was to identify any trends that were best explained as the result of deliberate

Figure 7 opposite
Differential weathering of moai *along the* Ara Moai. *AMS106: no difference; AMS120: lower eye/cheek more heavily weathered than upper eye; AMS104 chest more heavily weathered than lower chin/neck (photos: MST)*

LOC survey no	Resistivity	Geophysical anomaly at base	Visible structural/feature associations Comments
AMS102	yes	no	none
AMS103	no	n/a	sub-circular stone 'platform' at base of *moai* (Heyerdahl *et al.* 1989)
AMS104	yes	yes — low resistance	traces of possible excavation trench at base of *moai*
AMS105	yes	yes — high resistance	*c*.1 x 2m area of buried stones projecting through surface at base of *moai*
AMS106	yes	unknown	hollow/pit surrounded by upcast behind base of and to the south side of *moai*; rock mulch
AMS107	yes	yes – high resistance	stones projecting through surface at base of *moai*; rock mulch
AMS108	no	n/a	rock mulch
AMS109	no	n/a	rock mulch; a raised stone platform behind the *moai* built in 2013
AMS110	no	n/a	rock mulch
AMS111	no	n/a	rock mulch
AMS112	yes	yes – high resistance	rock mulch
AMS113	yes	inconclusive	linear stone feature abutting and at right angles to top of head, single-skinned to the north of the *moai* and double-skinned to the south (AMS068); patches of a *poro* pavement to the rear and north side of the *moai* (AMS069)
AMS114	yes	yes – high resistance	discrete stony area to rear of *moai*
AMS115	no	n/a	double-skinned *manavai* cell abutting base (AMS046); further, unidentified features on south side of *moai*
AMS116	no	n/a	Discrete hard 'packed layer' at base of *moai* (Heyerdahl *et al*. 1989, 55)
AMS117	yes	yes — high resistance	none
AMS120	yes	yes — high resistance	abutted by pile of stones—possibly a collapsed *manavai*/garden feature; rock mulch
AMS121	no	n/a	sub-circular, possible curb of earth-fast stones in rock mulch at base of *moai*; rock mulch extending under *moai*; human cranium beneath neck—burial; boulder carved with miniature *moai* (AMS240)
AMS123	no	n/a	base of *moai* lying at edge of a sub-circular stone-lined cut in slope—possible *manavai*; rock mulch
AMS125	yes	yes — high resistance	several areas of high resistance around the *moai* and an area of high magnetic susceptibility near its base—possibly unpublished excavations conducted by C. Cristino & P. Vargas
AMM005	no	n/a	amorphous stone structure around *moai*—possible collapsed *manavai*/garden feature
AMM009	no	n/a	base of *moai* buried; rock mulch
AMM0010	no	n/a	rock mulch; *umu* close to head
AMM011	no	n/a	small boulders under and behind base, and piled up against left-hand side of face—possible burial
AMM012	yes	no	stones projecting through surface at base of *moai*; rock mulch
AMM013	no	n/a	rock mulch
Pui	no	n/a	discrete stony area to rear of *moai*; thin rock mulch
AMN001	no	n/a	none
AMN002	yes	no	rock mulch
AMN003	yes	yes — low resistance with a high peak in the middle	rock mulch
AMN004	no	n/a	curved wall springing from base of *moai* — possible *manavai* (AMN005); rock mulch

Table 2

Resistivity, and structural and other archaeological associations (LOC 2010; 2014; 2015; Colin Richards pers. comm.)

intention. It entailed systematic recording of the position of each recumbent *moai* (prone, supine or on it side), whether or not it belonged to a discrete group, the orientation of its long axis and head (in terms of the cardinal points and conspicuous landscape or archaeological features), the visibility of other

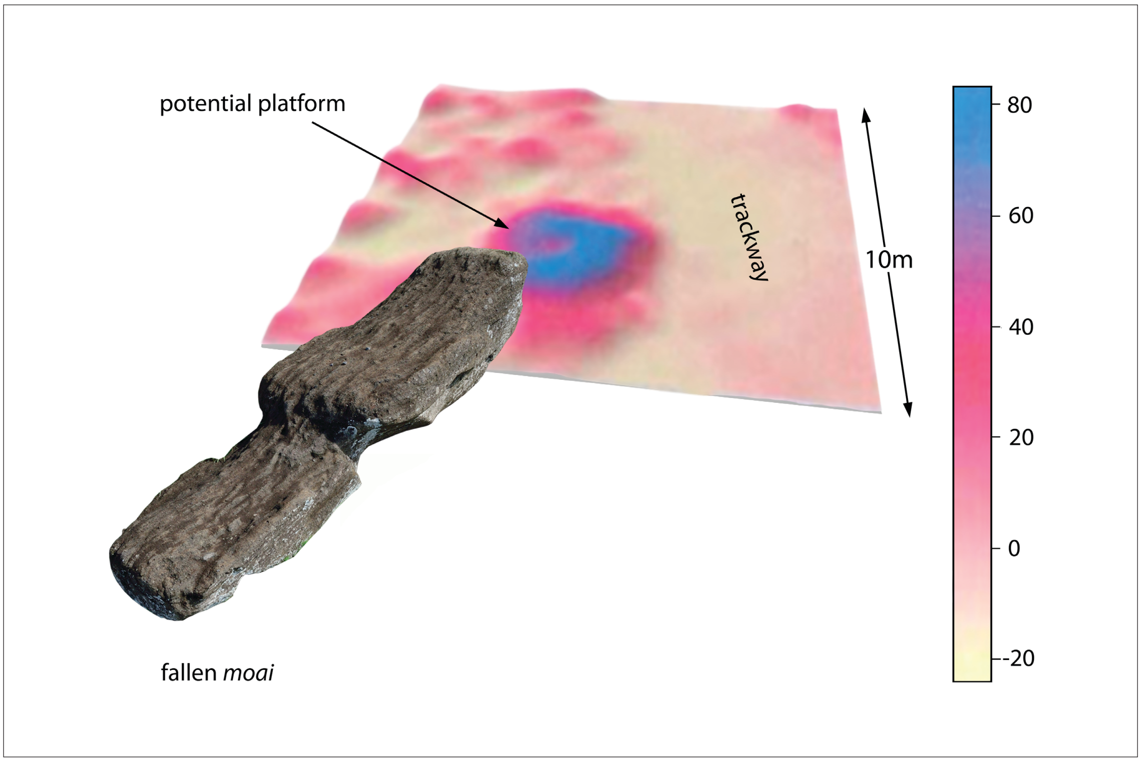

Figure 9

Geophysical anomaly to the rear of moai *AMS117 on the* Ara Moai *near Ahu Haŋa Teteŋa (blue = high resistance) (photo: Adam Stanford, Aerial Cam; geophysical plot Kate Welham)*

Figure 10

Moai *AMS114 orientated away from Rano Raraku (photo: Adam Stanford, Aerial Cam)*

moai from it (today and if standing), whether or not it was in a prominent location within the landscape (high, low), etc. We were also interested in the *perceptions* of someone journeying along the *Ara Moai*, both from and to Rano Raraku. A camera pole adjusted to the height of a *moai* and flying a white flag provided an effective proxy for an upstanding *moai*, while the recumbent position of the *moai* today was considered a suitable proxy for human activity in their immediate vicinity. Data on *moai* position and orientation were obtained from all three *Ara Moai*, while detailed phenomenological survey in the field was restricted to the *Ara Moai* south between Rano Raraku and Ahu Haŋa Teteŋa, and a short stretch of the *Ara Moai* middle, inland of Mauŋa Kahurea.

Survey was complicated by the height of the modern vegetation on both the *Ara Moai* south, between Rano Raraku and *moai* S116, and on the *Ara Moai* north. On the former, owing to the uneven topography the *ara* crosses, we often saw over the vegetation, while the craggy landscapes provided us with viewpoints and proxies for otherwise invisible features. At a handful of locations, however, we were not able to see enough to answer the questions we had set ourselves. On the *Ara Moai* north, which traverses more level ground, the problem was less easy to overcome, but because the ground is more uniform, we could predict with reasonable confidence what we would, and what we would not have been able to see had the vegetation been different.

It should also be born in mind that individual *moai* have surely disappeared and that in places the routes of the *Ara Moai* are conjectural (there are obvious gaps in the distribution of *moai* between LOC's *moai* AMS113 and AMS117, and AMM11 and AMM12). As is usually the case with archaeological fieldwork, therefore, our record is probably incomplete. Nonetheless we garnered sufficient data to identify both interpretively useful trends and interpretively useful perceptions.

Results

Looking at a distribution map of *moai* on all three *Ara Moai,* it is easy to understand why Métraux and Skjölsvold thought their distribution disorderly or casual (Fig. 4). It is true that *moai* on the *Ara Moai* south cluster towards Rano Raraku, but the change in their spacing is not regular, and although the average distance between them tends to diminish towards the quarry, there are both obvious gaps and stretches where *moai* cluster; while on the *Ara Moai* north and *Ara Moai* middle, no trend is apparent at all. *Moai* on the *Ara Moai* also occur on all sorts of slopes, high and low in the landscape, and in direct relationship to a range of very different types of landscape (and archaeological) feature. And although Rano Raraku tends to be "behind" them, there is little suggestion that they were deliberately orientated in relation to other features, or type(s) of feature. (Individual *moai* do align on other features, such AMM009 on Mauŋa Pui and AMM010 on Mauŋa Anamarana, but there is no discernable trend). Their distribution, however, is not wholly random.

On the line of the *Ara Moai* south, single *moai* occur in troughs in the landscape, on ridges and on slopes, but only "false crested" near the top, or at the bottom—never half way up. Tight clusters, moreover, occur only at low points. There are also two distinct visibility sets. Between Rano Raraku and *moai* AMS117, an area of undulating topography, each *moai* or group of *moai* would, if standing, have been intervisible with next. Likewise on the flatter *Ara Moai* north. But on the *Ara Moai* south between AMS117 and Ahu Hoa Aŋa Vaka A Tua Poi, which also traverses undulating ground, none would have been (Table 3). Indeed, it is *possible* that one *moai* along this stretch (AMS

LOC survey no	Position	Part of discrete group	Orientation red = *moai* head	Direction to Rano Raraku	Rano Raraku visible	Next *moai* west visible today	Next *moai* west visible if standing	Next *moai* east visible if standing	Position in landcape
AMS102	prone	N	N>S	NNE	Y	Y	Y	n/a	level ground
AMS103	prone	N	NNE>SSW	NNE	Y	Y	Y	Y	level ground
AMS104	prone	N	E>W	NNE	Y	Y	Y	Y	level ground
AMS105	prone	N	NE>SW	NNE	Y	Y	Y	Y	level ground
AMS106	prone	N	ENE>WSW	NNE	Y	Y	Y	Y	level ground
AMS107	prone/ on side	Y	NE>SW	NNE	Y	Y	Y	Y	trough
AMS108	prone	Y	ENE>WSW	NNE	Y	Y	Y	Y	trough
AMS109	prone	Y	ENE>WSW	NNE	Y	Y	Y	Y	trough
AMS110	supine	Y	NE<SW	NNE	Y	Y	Y	Y	trough/ bottom of slope
AMS111	prone	Y	NE>SW	NNE	Y	Y	Y	Y	trough/ bottom of slope
AMS112	supine	Y	ESE<WNW	NNE	Y	N	U	Y	trough/ bottom of slope
AMS113	prone	N	NE>SW	NE	Y	N	Y	U	on ridge
AMS114	prone	N	NE>SW	NE	Y	N	Y	Y	trough
AMS115	supine	N	ENE<WSW	NE	behind Toa Toa	N	Y	Y	on ridge
AMS116	prone	N	ENE>WSW	NE	behind Toa Toa	U	Y	Y	top of slope
AMS117	prone	N	NE>SW	NE	Y	N	N	Y	bottom of slope
AMS120	prone	Y	ESE>WNW	ENE	N	N	Y	N	trough
AMS121	prone	Y	E>W	ENE	N	N	N	Y	trough
AMS123	supine	N	NE<SW	ENE	Y	N	N	N	top of slope
AMS125	prone	N	NE>SW	ENE	Y	n/a	n/a	U	trough/ level ground
AMM009	prone	N	NW<SE	E	Y	N	N	n/a	top of slope
AMM010	prone	N	NE>SW	E	Y	N	N	N	top of slope
AMM011	supine	N	E<W	E	Y	N	N	N	trough
AMM012	prone	N	ENE>WSW	E	n/a	N	Y	n/a	trough/ bottom of slope
AMM013	supine	N	NW<SE	E	n/a	n/a	N	Y	gently sloping ground above steep slope
AMN001	prone	N	E>W	ESE	Y	U	Y	n/a	level ground
AMN002	on side	N	ESE>WNW	ESE	Y	U	Y	Y	level ground
AMN003	prone	N	ESE>WNW	ESE	Y	U	Y	Y	level ground
AMN004	prone	N	ESE>WNW	ESE	Y	n/a	n/a	Y	level ground

Table 3

The position of moai *along the* Ara Moai

123) was "placed" in order to inhibit intervisibility from the west, for had it been moved upslope by as little as a hundred metres, there would have been no trend to observe. Also notable is the failure of "road" *moai* close to *ahu* to reference these (AMS120 and AMS121, located in front of Ahu Haŋa Teteŋa, and AMS125 in front of Ahu Oroi). The *Ara Moai* middle does not conform exactly, for it includes adjacent *moai* that would have been intervisible, and adjacent *moai* that would not have been intervisible, but the location of *moai* near the tops or at the bottom of slopes is the same, as is the possibility that

three out of the five *moai* surveyed (AMM009, AMM010 and AMM013) were "placed" in order to inhibit intervisibility from the west, while the two *moai* that would have been intervisible, AMM012 and AMM013, would have been only *just* intervisible and activities at their bases, not intervisible. Some of this could of course be fortuitous, but not all?

The *Ara Moai* lead to and from Rano Raraku. Approaching the quarry along the *Ara Moai* south or the *Ara Moai* middle, it comes in and goes out of view, a goal pointed at by successive *moai*, growing more dominant at each crest in the landscape. Each new view, each new *moai*, creates a moment of drama. On the *Ara Moai* north, the quarry is always in view, and the drama builds slowly, but inexorably. This theatricality derives from the potency, real or imagined, of the quarry, the position of the *moai* in the landscape, leading the journeyer towards it, and the way both the *moai* and the quarry come into and go out of view. A journey in the other direction, because it has no obvious goal, is much less theatrical. Of course, like some other person-centred observations, ours are highly subjective. Who knows what a prehistoric Rapanui would have found theatrical, or not? But could they be correct nonetheless, and could the locations of *moai* along the *Ara Moai* have been deliberate? Currently the best evidence for this is our interpretation of these as "non-random". Why otherwise would clusters only occur at the base of slopes (three out of three); why otherwise would *moai* located on slopes mostly be "false crested" (five out of six)? We conclude therefore that the *moai* along the *Ara Moai* are not technological or ritual failures and that their position along them is deliberate. It would be nice, however, to have a bit more evidence.

WIDER CONTEXT

In the absence of a continuous and unambiguous prehistoric road, LOC's feature survey along the *Ara Moai* south between Rano Raraku and Ahu Hoa Aŋa Vaka A Tua Poi took in a wide transect, extending up to 100m either side of a modern footpath, which today links the *moai* demarcating it. Detailed survey focused on two stretches, one between Rano Raraku and Ahu Haŋa Teteŋa (LOC 2013, 10–22) and another between *moai* S123 and Ahu Oroi (LOC 2014, 7–18, appx 1). For the survey as a whole our focus was on the form, preservation and relationships of the archaeological features comprising and associated with the alignment. In studying and documenting the *Ara Moai* in this way, we hoped to place it more clearly both in a landscape and wider archaeological context, and in so doing make it more accessible for interpretative purposes.

In all, 244 features were recorded. A wide range of types was identified. Within the area of the detailed survey, most frequently encountered were: *umu* (17%), minor quarries (11.5%), *manavai* (9%), *avaŋa/hare moa* (8%) (feature types, which in a ruinous state are impossible to distinguish), *moai* with wedge eyes (8%), and *hare paeŋa* and *hare paeŋa*-type pavements (7.5%). While relatively common on the stretch of the *Ara Moai* to the east of Ahu Haŋa Teteŋa, *moai* were very definitely a minority type further west. In those parts of the survey area where feature visibility was good, most of the features identified cluster into discrete feature complexes or sites (Fig. 11). Typically these comprise a "house" (a *hare paeŋa*, a *hare paeŋa*-type pavement or an unidentified *poro* pavement), one or more *umu*, an *avaŋa/hare moa* or a stone spread and sometimes a *manavai.* These sites are similar to what is found in many parts of the Rapa Nui landscape (e.g. LOC 2016; 2019;

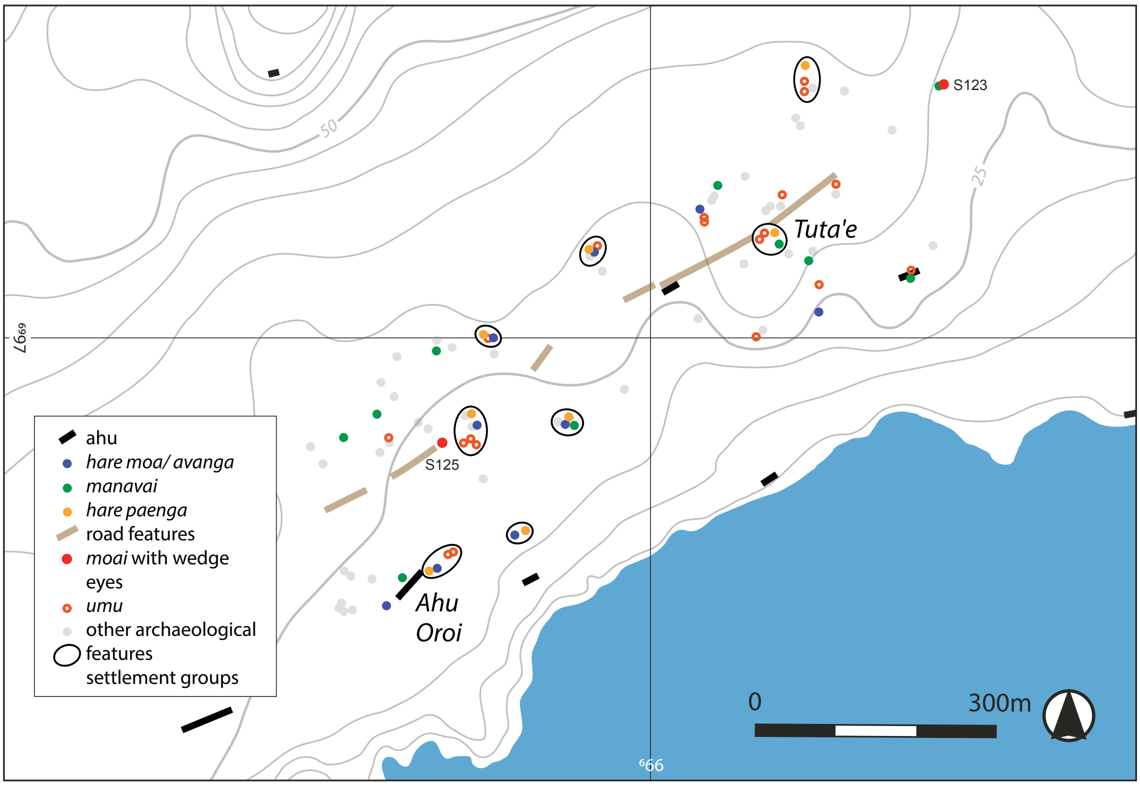

Figure 11

Archaeological features recorded along a stretch of the Ara Moai *south (drawing: MST; GIS plot Kate Welham)*

Figure 12

Moai *AMS115 abutted by a collapsed* manavai *to the rear. Scale 1m (photo: Adam Stanford, Aerial Cam)*

Stevenson & Cristino 1986; Vargas *et al*. 2006). The distance between them varies. Sometimes they are very close but a gap of a hundred metres or more between them is usual. The different extent to which different complexes have been robbed, however, suggests that they are not contemporaneous (cf. LOC in prep.), and that the gap between functioning sites was wider still. They occur both on high points and low points in the landscape, but where available, high points were favoured.

None of course can be placed in unambiguous chronological association with the *Ara Moai*. Interpretation focused on the observation that the configuration of features and sites found near the *Ara Moai* is the same as that present in many other places on the island but differs from that of features found around coastal *ahu*, where houses (contemporary or successive) cluster together (LOC in prep.). The implication is that the *Ara Moai* did not impose an environment of sacred/exclusionary space beyond the precise boundaries of its route and that contemporary or subsequent daily life abutted it. In particular, the occurrence of *manavai* complexes and structures subsequently built around and against recumbent *moai* (and inland *ahu*) (Fig. 12; Table 2), indicates that they had lost any physical form of sanctity or, conversely, that after they fell or were laid down people continued to believe that their special properties could exert some power through physical association—a view acknowledged by many Rapanui to this day (Julio Haoa Avaka pers. comm.).

INTERPRETATIVE OBJECTIONS

Phenomenology

Phenomenological survey is subjective rubbish and proves nothing. For example, in the absence of a demonstrably sound archaeological context, the assessment that the location of a *moai* just below a ridge, rather than on it, is somehow meaningful, is pure fancy. LOC would answer this by saying that the non-pragmatic use of stone on the island and in wider Polynesia *is* a demonstrably sound archaeological context (Hamilton *et al*. 2011.; LOC 2020; Seager Thomas 2014 etc.). The problem here is not our interpretation but the weight of evidence upon which it is based, a fact we readily acknowledge.

Upright transport

The principal challenge to Routledge's, the Belgian team's and our interpretation of the *Ara Moai* as intentional alignments of formerly upstanding *moai* is the theory that these *moai* were abandoned while in transport in a standing position. To many this theory is just silly: myths need not reflect reality accurately. But once you accept that upright transport is possible, and in the case of *moai* several experimental studies have shown this to be the case (Lipo *et al*. 2013; Love 1990; Pavel 1995), many of the arguments in favour of a deliberate *moai* alignment disappear, including that based on the differential weathering of the fronts of *moai*. The challenge for us then is to show that the evidence cited in favour of *moai* transport in a standing position is no such thing, and to present evidence peculiar to our preferred interpretation. Lipo *et al*. cite the following evidence in favour of their theory: 1) the *moai* along the *Ara Moai* lie parallel to them; 2) they are not associated with *ahu* (nor do they appear to reference them—see p. 19); 3) they have wedged, as opposed to hollowed out eyes; 4) they have proportionately wider bases than most

ahu moai; 5) their bases are angled in a way which would cause them to lean forward if erected; 6) they are broken, indicating fall from an upright position; 7) many (70%) have pressure flake scars on the base; and 8) their direction of fall corresponds to the slope where they fell (Lipo *et al*. 2013: 2860–1).

Many of these lines of evidence (1–6, and 8) can be dismissed out of hand since they either correspond to, or are not inconsistent with what would be expected of *moai* forming part of a deliberate alignment. (4) and (5), indeed,

Figure 13
Fracture on the base of supine moai *N004. Scale 10cm (photo: MST)*

in so far as they highlight typological differences between *ahu moai* and *moai* on the *Ara Moai* and at Rano Raraku, are perhaps more consistent with LOC's interpretation than with theirs, since they raise the possibility of two sets of *moai* belonging to two different phases or conceptions of *moai* carving and erection. As for (7), Rano Raraku tuff is inhomogeneous and does not fracture cleanly, while the fractures themselves are often heavily weathered (Fig. 13), and the likely cause or causes of these far from certain. Pressure flakes *could* anyway have been caused had the *moai* been deliberately overthrown.

The movement of pre-weathered moai

There is abundant evidence that many *moai* at Rano Raraku were never intended to be moved (Cauwe 2011, 25–33; Hamilton *et al*. 2011, 178–79; Routledge 1919, 181–82; Skjölsvold 1961, 365). It is possible therefore that the idea of erecting *moai* on *ahu* was *secondary* to their carving and setting up at Rano Raraku. If so, *moai* selected for erection at *ahu* could have been transported and set up or abandoned in a pre-weathered condition, which would mean that our observations need have no baring on the time they stood along the *Ara Moai*. Evidence against the possibility of *abandonment* during transport in a pre-weathered condition lies in their distribution and our observations on *moai* visibility, and, for abandonment in a recumbent position, in the degree of weathering recorded on the downward sides of many of the prone *moai* along the *Ara Moai*, which is heavier than that on the fronts of many *moai* still standing on the outer flanks of Rano Raraku.

CONCLUSION

The simple answer to the question posed by the title of this essay is 'yes', the *moai* along Easter Island's *Ara Moai* were formerly standing; and it is LOC's work on the weathering of their *downward sides*, not the Belgian team's work on the weathering of their *upward* sides, which demonstrates this. LOC's work also poses another challenge to the old theory that the *moai* along the *Ara Moai* were abandoned during transit in a *recumbent position*. We have not, however, proved conclusively that they were deliberate alignments or disproved that they were abandoned in transit while in a standing position. LOC's survey thus provides no additional evidence for the ritualisation of Rano Raraku, to which the *Ara Moai* led, and no evidence in favour of the catastrophe theory.

It remains LOC's view, however, that Rano Raraku was not just a quarry and the *Ara Moai* were not just roads along which *moai* were transported.

It is not currently our intention to return to this issue, but we have several suggestions, which might help resolve it in the future. Firstly, we would like to see more geophysical survey to establish whether or not the anomalies identified by us have any archaeological—as opposed to geological or geomorphological—reality. Secondly, we would like to see the locational/phenomenological survey expanded, and conducted and recorded more systematically than we were ourselves were able. Two variables (clustering and "false cresting") and 13 out of 50-odd extant "road" *moai* is not an interpretatively viable sample. Each *ara* needs to be walked both ways repeatedly, and new interpretatively useful variables identified and integrated into the survey, and the perceptions gained cross-checked and compared, and assessed in terms of the arguments for and against both our, and Lipo *et al*.'s interpretations of them. Finally, we would like Lipo *et al*.'s "concoidal" fractures looked at again.

REFERENCES

Baker, P. 1998 Petrological factors influencing the utilization of stone on Easter Island. In Lee G, Stevenson, C & Morin, F (eds), *Easter Island in Pacific Context*, 279–83. Proceedings of the Fourth International Conference on Easter Island and East Polynesia. Easter Island Foundation.

Cauwe, N. 2011 *Easter Island: Rebuilding its History After Ten Years of Excavations. The Great Taboo*. Louvain-la-Neuve: Versant Sud.

Cauwe, N., & **De Dapper, M.** 2015 The road of the moai, an interrupted travelator. In Cauwe, N., & De Dapper, M. (eds), *Easter Island: Collapse or Transformation? A State of the Art*, 9–58. Brussels: Royal Academy for Overseas Sciences.

Charola, E. 1997 *Death of a Moai. Easter Island Statues: their Nature, Deterioration and Conservation*. Easter Island Foundation Occasional paper **4**.

CONAF [*Corporacion National Forestal*] 2012 *Diagnostico en Conservación de la Zona de Uso Intensivo de Rano Raraku.* Rapa Nui: CONAF.

Cook, J. 1777 [2007] *A Voyage towards the South Pole and Round the World*, *Vol. 1*. Teddington: Echo Library.

Cristino, C., Vargas, P. & **Izaurieta, R.** 1981 *Atlas arqueólogica de Isla de Pascua*. Santiago: Facultad de Arquitectura y Urbanismo, Instituto de Estudios, Universidad de Chile.

Flenley, J. & **Bahn, P.** 2002 *The Enigmas of Easter Island*. Oxford: Oxford University Press.

Flenley, J., King, A., Teller, I., Prentice, M., Jackson, J. & **Chew, C.** 1991 The late quaternary vegetational and climatic history of Easter Island. *Journal of Quaternary Science* **6**, 85–115.

Gioncada, A., Gonzalez-Ferran, O., Lezzerini, M., Mazzuoli, R., Bisson, M. & **Rapu, S.** 2010 The volcanic rocks of Easter Island (Chile) and their use for the moai sculptures. *European Journal of Mineralogy* **22**, 555–67.

Hamilton, S. 2013 Rapa Nui (Easter Island)'s Stone Worlds. *Archaeology International* **16**, 96-109.

Hamilton, S. & **Seager Thomas, M.** 2011 Say it with stone: constructing with stones on Easter Island. *World Archaeology* **43(2)**, 167–90.

Handy, E. 1927 [1971] *Polynesian Religion.* Bernice P. Bishop Museum Bulletin **34**. New York: Krauss Reprint Co.

Heyerdahl. T. 1975 *The Art of Easter Island*. New York: Doubleday & Co.

Heyerdahl, T. & **Ferdon, E.** Jr (eds) 1961 *Reports from the Norwegian Archaeological Expedition to Easter Island and the South Pacific, vol. 1: The Archaeology of Easter Island*. Monographs of the School of American Research and Museum of New Mexico **24 (1)**. Stockholm: Forum.

Heyerdahl, T., Skjölsvold, A. & **Pavel, P.** 1989 The 'walking' moai of Easter Island. *Kon Tiki Museum Occasional Papers* **1**, 36–64

Lipo, C. & **Hunt, T.** 2005 Mapping prehistoric statue roads on Easter Island. *Antiquity* **79**, 158–68.

Lipo, C., Hunt, T. & **Rapu, S.** 2013 The 'walking' megalithic statues (moai) of Easter Island. *Journal of Archaeological Science* **40**, 2859–2866.

LOC [Rapa Nui Landscapes of Construction Project] 2010. Report on geophysical surveys conducted to the rear of several *moai* along the Southern *Ara Moai. Rapa Nui Landscapes of Construction Interim Reports* **4**.

L**OC [Rapa Nui Landscapes of Construction Project]** 2013 Preliminary multi-scalar survey of the southwest section of the Ara Moai, 2013. *Rapa Nui Landscapes of Construction Interim Reports* **7**.

LOC [Rapa Nui Landscapes of Construction Project] 2014 Multi-scalar survey of the southwestern Ara Moai between Ahu Hanga Tetenga and Ahu Hoa Anga Vaka A Tua Poi. *Rapa Nui Landscapes of Construction Interim Reports* **9**.

LOC [Rapa Nui Landscapes of Construction Project] 2015 Work on the *Ara Moai* (northwest and south) and at Rano Raraku, 2015. *Rapa Nui Landscapes of Construction Interim Reports* **11**.

LOC [UCL Rapa Nui Landscapes of Construction Project] 2016 Survey on Poike, 2016. *Rapa Nui Landscapes of Construction Interim Reports* **13**.

LOC [UCL Rapa Nui Landscapes of Construction Project] 2019 New Ccontextual survey of Poike. *Rapa Nui Landscapes of Construction Interim Reports* **15**.

LOC [UCL Rapa Nui Landscapes of Construction Project] 2020 The LOC taheta survey: interpreting an understudied, everyday Rapa Nui feature category. *Rapa Nui Landscapes of Construction Interim Reports* **16**.

LOC [UCL Rapa Nui Landscapes of Construction Project] In prep. The LOC *hare paeŋa* survey. *Rapa Nui Landscapes of Construction Interim Reports* **18**.

Love, C. 1990 How to make and move an Easter Island statue. In Esen-Bauer, H. (ed.), *State and Perspectives of Scientific Research in Easter Island Culture*, 139–40. Frankfurt: Courier Forschungsinstitut Senckenburg.

Love, C. 2001 *The Easter Island Moai Roads: an Excavation Project to Investigate the Roads Along which the Easter Islanders Moved their Gigantic Ancestral Statues*. Unpublished Report. Rock Springs: Western Wyoming Community College.

Martinsson-Wallin, H. 1996 The eyes of the *moai*, lost and re-discovered. *Rapa Nui Journal* **9(1)**, 41–43.

Métraux, A. 1957 *Easter Island*. London: Scientific Book Club.

Mulloy, W. 1997 [1973] Restoration of Ahu Huri A Urenga and Two Unnamed Ahu at Hanga Kio'e. Easter Island Bulletin **3**. In Mulloy, W., *The Easter Island Bulletins of William Mulloy, 43–71.* New York: World Monuments Fund.

Pavel, P. 1995 Reconstruction and transportation of the *moai* statues and pukao hats. *Rapa Nui Journal* **9**, 69–72.

Richards, C., Croucher, K., Paoa, T., Parish, T., Tucki, E. & **Welham, K.** 2011 Road my body goes: re-creating ancestors from stone at the great moai quarry of Rano Raraku, Rapa Nui (Easter Island). *World Archaeology* **43(2)**, 191–210.

Routledge, K. 1919 T*he Mystery of Easter Island*. London: Privately published.

Seager Thomas, M. 2014 Stone use and avoidance on Easter Island: Red scoria from the topknot quarry at Puna Pau and other sources. *Archaeology in Oceania* **49**, 95–109.

Shepardson, B. 2003 Moai database. *Terevaka Net* [online]. http://www.terevaka.net/moai/index.html

Skjölsvold, A. 1961 The stone statues and quarries of Rano Raraku. In Heyerdahl T. & Ferdon E. Jr (eds), *Reports from the Norwegian Archaeological Expedition to Easter Island and the South Pacific, vol. 1: The Archaeology of Easter Island*, 339–79. Monographs of the School of American Research and Museum of New Mexico **24(1)**. Stockholm: Forum.

Stevenson, C. & **Cristino, C.** 1986 Residential settlement history of the Rapa Nui south coastal plain. *New World Archaeology* **7(1)**, 29–38.

Vargas, P., Cristino, C. & **Izaurieta, R.** 2006 *100 Años en Rapa Nui: Arqueología del Asentamiento*. Santiago: Editorial Universitaria.

Van Tilburg, J. 1994 *Easter Island. Archaeology, Ecology and Culture*. London: British Museum Press.

Van Tilburg, J. 1996. Mechanics, logistics and economics of transporting Easter Island (Rapa Nui) statues. *Rapa Nui Journal* **10**, 110–15.

Appendix 1: Weathering on the fronts of *moai* recording sheet

LOC — WEATHERING ON THE FRONTS OF *MOAI*

SITE NAME		AMS NO	
MOAI NO		GRID REF	

Position of moai *(circle)*: standing standing at angle *(draw overleaf)* prone supine on side

RIGHT SIDE			LEFT SIDE	
Position on body	Severity		Position on body	Severity
Upper eye	*Not visible* ☐ *light* ☐ *moderate* ☐ *heavy* ☐		Upper eye	*Not visible* ☐ *light* ☐ *moderate* ☐ *heavy* ☐
Lower eye/ cheeks	*Not visible* ☐ *light* ☐ *moderate* ☐ *heavy* ☐		Lower eye/ cheeks	*Not visible* ☐ *light* ☐ *moderate* ☐ *heavy* ☐
Lower chin	*Not visible* ☐ *light* ☐ *moderate* ☐ *heavy* ☐		Lower chin	*Not visible* ☐ *light* ☐ *moderate* ☐ *heavy* ☐
Chest	*Not visible* ☐ *light* ☐ *moderate* ☐ *heavy* ☐		Chest	*Not visible* ☐ *light* ☐ *moderate* ☐ *heavy* ☐
Lower stomach/ hands	*Not visible* ☐ *light* ☐ *moderate* ☐ *heavy* ☐		Lower stomach/ hands	*Not visible* ☐ *light* ☐ *moderate* ☐ *heavy* ☐
	Not visible ☐ *light* ☐ *moderate* ☐ *heavy* ☐			*Not visible* ☐ *light* ☐ *moderate* ☐ *heavy* ☐

Lower nose	*Not visible* ☐ *light* ☐ *moderate* ☐ *heavy* ☐

COMMENTS

INITS		DATE	

Appendix 2: Locations of *moai* surveyed by LOC and correspondences between the numbering system used by us and other projects

Moai no	Position	Location	Grid reference	Shepardson/ *Atlas Arqueológico*	Cauwe & De Dapper	Lipo & Hunt	Lipo & Hunt superseded
AMS102	prone	*Ara Moai* south/ Rano Raraku	0669451/6998251	RR-117	n/a	n/a	n/a
AMS103	prone	*Ara Moai* south	0669436/6998330	13-477	M15	n/a	n/a
AMS104	prone	*Ara Moai* south	0669434/6998190	13-478	M16	500	950
AMS105	prone	*Ara Moai* south	0669389/6998173	13-481	M17	502	951
AMS106	prone	*Ara Moai* south	0669339/6998131	13-485	M18	503	953
AMS107	prone on side	*Ara Moai* south	0669148/6998014	13-486	M21	504	954
AMS108	prone	*Ara Moai* south	0669135/6998017	13-487	M19	505	955
AMS109	prone	*Ara Moai* south	0669128/6998025	13-488	M20	506	956
AMS110	supine	*Ara Moai* south	0669039/6997971	13-490	M22	507	957
AMS111	prone	*Ara Moai* south	0669043/6997967	13-491	M24	n/a	958
AMS112	supine	*Ara Moai* south	0669034/6997965	13-492	M23	510	959
AMS113	prone	*Ara Moai* south	0668832/6997858	13-509	M25	520	960
AMS114	prone	*Ara Moai* south/ Mauŋa Toa Toa	0668340/6997586	13-177	M26	521	961
AMS115	supine	*Ara Moai* south	0668163/6997561	13-096	M27	522	962
AMS116	prone	*Ara Moai* south	0668049/6997481	13-052	M28	523	963
AMS117	prone	*Ara Moai* south/ Haŋa Teteŋa	0667412/6997259	12-030	M29	188	633
AMS120	prone	*Ara Moai* south	0667183/6697478	12-013	M30	525	965
AMS121	prone	*Ara Moai* south	0667175/6997490	12-014	M31	524	964
AMS122	prone	*Ara Moai* south (*ahu*-type *moai* in pit)	0666632/6997327	12-172	M32	526	966
AMS123	supine	*Ara Moai* south	0666371/6993717	12-220	M33	527	967
AMS124	prone	*Ara Moai* south/ *ahu*-type *moai* on ruins of unnamed *ahu* (AMS169)	0666035/6997066	12-255	n/a	528	968
AMS125	prone	*Ara Moai* south	0665714/6996851	12-397	M34	529	969
AMS244	supine	Ahu Hoa Aŋa Vaka a Tua Poi	665347/6996581	12-452	n/a	n/a	n/a
05-080	prone	Ahu Haŋa Hahave (possible western limit of south road)	0659508/6994115	05-080	M39	116	n/a
AMM001	prone	*Ara Moai* middle/ Rano Raraku	0669199/6998638	RR-149	n/a	n/a	n/a
AMM003	supine	*Ara Moai* middle	0668090/6998726	13-330	n/a	n/a	n/a
AMM004	supine	*Ara Moai* middle	0668050/6998717	13-331	n/a	n/a	n/a
AMM005	prone	*Ara Moai* middle	0667979/6998704	13-332	n/a	n/a	n/a
AMM006	supine	*Ara Moai* middle	0667874/6998492	13-243		n/a	n/a
AMM007	prone	*Ara Moai* middle	0667131/6998667	12-076		n/a	n/a

Moai no	Position	Location	Grid reference	Shepardson/ *Atlas Arqueológico*	Cauwe & De Dapper	Lipo & Hunt	Lipo & Hunt superseded
AMM008	prone	*Ara Moai* middle	0666747/6998860	19-999	M02	n/a	n/a
AMM009	prone	*Ara Moai* middle	0666517/6998860	19-998	M07	n/a	n/a
AMM010	prone	*Ara Moai* middle	0666188/6998920	19-997	M08	n/a	n/a
AMM011	supine	*Ara Moai* middle	0665923/6998694	19-994	M09	n/a	n/a
AMM012	prone	*Ara Moai* middle	0664350/6998411	11-226	M10	n/a	n/a
AMM013	supine	*Ara Moai* middle	0664155/6998405	11-205	M11	n/a	n/a
18-350	supine	under Pui	0665430/6999695	18-350	M03	n/a	n/a
AMN001	prone	*Ara Moai* north	0669013/6999018	13-431	n/a	616	n/a
AMN002	on side	*Ara Moai* north	0668702/6999340	13-413	n/a	617	n/a
AMN003	prone	*Ara Moai* north	0668184/6999673	20-995	n/a	623	1055
AMN004	supine	*Ara Moai* north	0667901/6999878	20-997	M1	625	n/a
32-997	prone	Ahu Vai Mata	659292/7005158	32-997	M41	Vai Mata F39	n/a
RR-043	standing	Rano Raraku	0669735/6998378	RR-043	n/a	n/a	n/a
RR-049	standing	Rano Raraku	0669721/6998396	RR-049	n/a	n/a	n/a
RR-050	standing	Rano Raraku	0669718/6998398	RR-050	n/a	n/a	n/a
RR-051	standing	Rano Raraku	0669711/6998397	RR-051	n/a	n/a	n/a
RR-055	standing	Rano Raraku	n/a	RR-055	n/a	n/a	n/a
RR-063	standing	Rano Raraku	0669669/6998390	RR-063	n/a	n/a	n/a
RR-066	prone	Rano Raraku	0669686/6998377	RR-066	n/a	n/a	n/a
RR-077	standing	Rano Raraku	0669664/6998377	RR-077	n/a	n/a	n/a
RR-079	standing	Rano Raraku	0669652/6998384	RR-079	n/a	n/a	n/a
RR-086	standing	Rano Raraku	0669624/6998428	RR-086	n/a	n/a	n/a
RR-089	standing	Rano Raraku	0669599/6998414	RR-089	n/a	n/a	n/a
RR-098	standing	Rano Raraku	n/a (*moai* Piro Piro)	RR-098	n/a	n/a	n/a
17-999	prone	Ahu Ava Raŋa Uka A Toroke Hau	0662349/7000381	17-999	n/a	n/a	n/a
05-217	prone	Ahu Mata Ketu	0659735/6995018	05-217	n/a	n/a	n/a

Appendix 3: *Moai* surveyed

Figure A3.1
Moai *AMS102. Scale 1m (photo: Adam Stanford, Aerial Cam)*

Figure A3.2
Moai *AMS103. Scale 1m (photo: Adam Stanford, Aerial Cam)*

Figure A3.3
Moai *AMS104. (photo: MST)*

Figure A3.4
Moai *AMS104, detail of left eye (photo: Adam Stanford, Aerial Cam)*

Figure A3.5
Moai *AMS105. Scale 1m (photo: Adam Stanford, Aerial Cam)*

Figure A3.6
Moai *AMS105, detail of left neck and upper chest (photo: Adam Stanford, Aerial Cam)*

Figure A3.7
Moai *AMS106. Scale 1m (photo: Adam Stanford, Aerial Cam)*

Figure A3.8
Moai *AMS106. Note the spoil heap to the rear left (photo: MST)*

Figure A3.9
Moai *AMS107 (photo: MST)*

Figure A3.10
Moai *AMS107. Detail of unweathered face (photo: MST)*

Figure A3.11
Moai *AMS108. Scale 1m (photo: Adam Stanford, Aerial Cam)*

Figure A3.12
Moai *AMS107. Detail of left eye (photo: MST)*

Figure A3.13
Moai *AMS109. Note the* moai*'s relatively unweathered hands (photo: MST)*

Figure A3.14
Moai *AMS110. Scale 1m (photo: Adam Stanford, Aerial Cam)*

Figure A3.15
Moai *AMS111 with AMS110 and AMS112 (photo: Adam Stanford, Aerial Cam)*

Figure A3.16
Moai *AMS112. Scale 1m (photo: Adam Stanford, Aerial Cam)*

Figure A3.17
Heavily weathered fracture across moai *AMS112. (photo: MST)*

Figure A3.18
Moai *AMS113 (photo: MST)*

Figure A3.19
Moai *AMS114 (photo: MST)*

Figure A3.20
Moai *AMS114. Detail of right upper eye and cheek (photo: MST)*

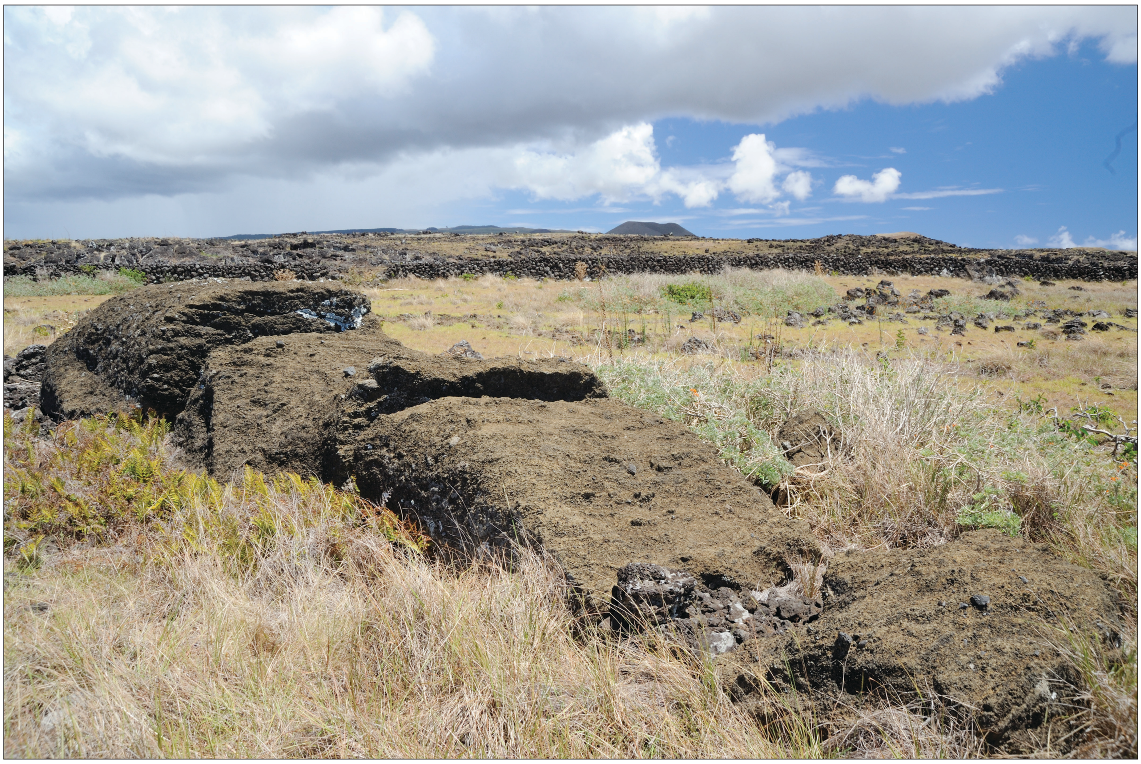

Figure A3.21
Moai *AMS115 (photo: Adam Stanford, Aerial Cam)*

Figure A3.22
Moai *AMS116 (photo: MST)*

Figure A3.23
Moai *AMS117 (photo: Adam Stanford, Aerial Cam)*

Figure A3.24
Moai *AMS120 (photo: Adam Stanford, Aerial Cam)*

Figure A3.25
Moai *AMS121 (photo: MST)*

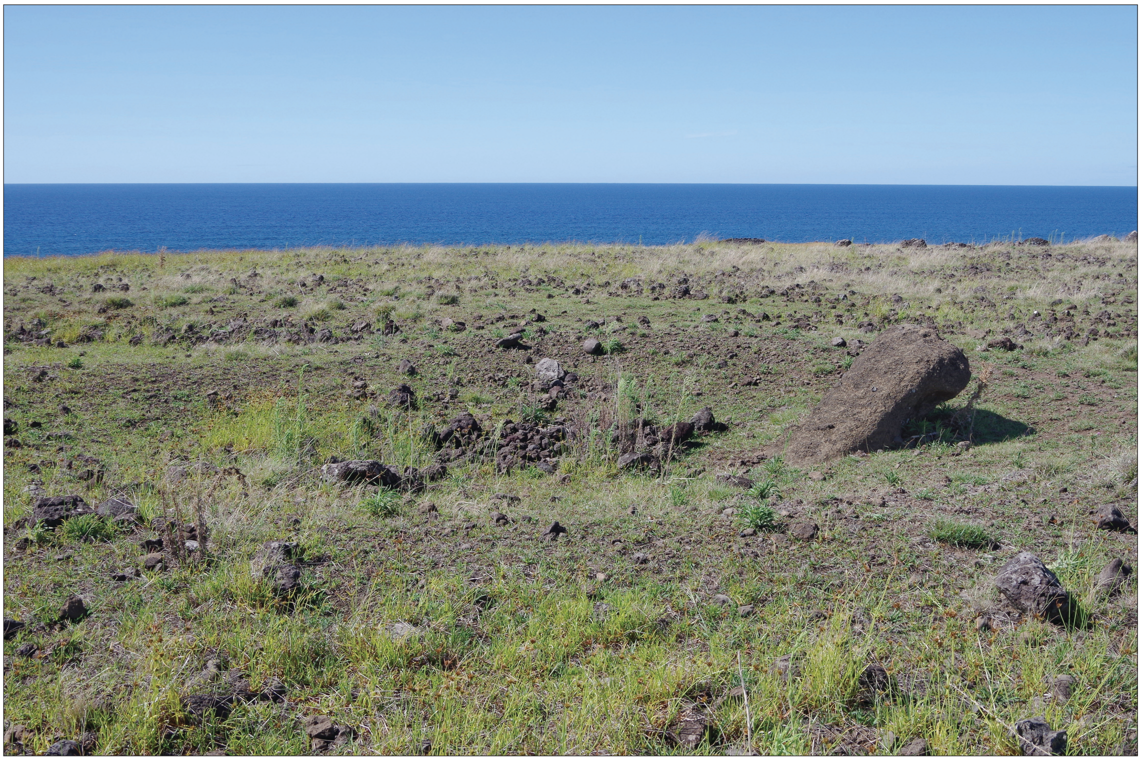

Figure A3.26
Ahu moai *AMS122, buried in a pit on the approximate line of the* Ara Moai *south (photo: MST)*

Figure A3.27
Moai *AMS123 (photo: MST)*

Figure A3.28
Ahu moai *AMS124, adjacent to a stretch of visible "road" (photo: MST)*

Figure A3.29
Moai *AMS125 (Cook's* moai*) (photo: MST)*

Figure A3.30
Moai *AMS244 in front of Ahu Hoa Aŋa Vaka a Tua Poi (photo: Adam Stanford, Aerial Cam)*

Figure A3.31
Moai *AMM001 with Rano Raraku behind (photo: Adam Stanford, Aerial Cam)*

Figure A3.32
Moai *AMM001. Detail of left lower chin and upper chest (photo: MST)*

Figure A3.33
Moai *AMM005 (photo: MST)*

Figure A3.34
Moai *AMM009 (photo: MST)*

Figure A3.35
Moai *AMM009. Detail of unweathered right eye and upper cheek (cf. Fig A3.1) (photo: MST)*

Figure A3.36
Moai *AMM010 (photo: MST)*

Figure A3.37
Moai *AMM011 with Mauŋa Pui behind (photo: MST)*

Figure A3.38
Moai *AMM012 (photo: MST)*

Figure A3.39
Moai *AMM012. Detail of right eye. Scale 30cm (photo: MST)*

Figure A3.40
Moai *AMM013 (photo: MST)*

Figure A3.41
Moai *AMN001. Note the* taheta *in its back (photo: MST)*

Figure A3.42
Moai *AMN002 (photo: MST)*

Figure A3.43
Moai *AMN002. Detail of left eye. Scale 50cm (photo: MST)*

Figure A3.44
Moai *AMN003 with Rano Raraku behind (photo: MST)*

Figure A3.45
Moai *AMN004 (photo: MST)*

Figure A3.46
Moai *32-997 at Ahu Vai Mata (photo: MST)*

Figure A3.47
Moai *RR-043 (photo: MST)*

Figure A3.48
Moai *RR-049 and RR-50 (behind) (photo: MST)*

Figure A3.49
Moai *RR-051 (photo: Adam Stanford, Aerial Cam)*

Figure A3.50
Moai *RR-051. Detail of eyes and nose (photo: MST)*

Figure A3.51
Moai *RR-055 (photo: MST)*

Figure A3.52
Moai *RR-063 (photo: MST)*

Figure A3.53
Moai *RR-063. Detail of left eye and upper cheek (photo: MST)*

Figure A3.54
Moai *RR-063. Detail of protected area under left ear (photo: MST)*

Figure A3.55
Moai *RR-066 (prone) (photo: MST)*

Figure A3.56
Moai *RR-066. Detail of left eye and upper cheek (photo: MST)*

Figure A3.57
Moai *RR-077 (photo: MST)*

Figure A3.58
Moai *RR-077. Detail of left eye (photo: MST)*

Figure A3.59
Moai *RR-079 (known as Hiara) (photo: MST)*

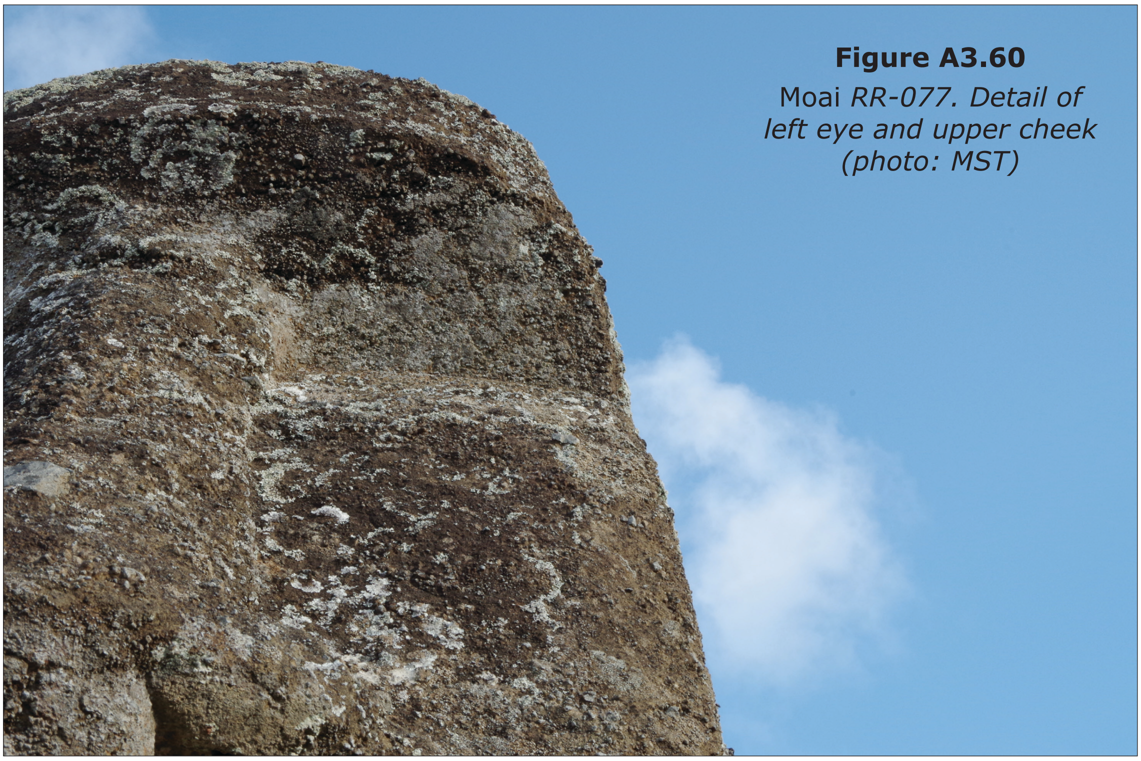

Figure A3.60
Moai *RR-077. Detail of left eye and upper cheek (photo: MST)*

Figure A3.61
Moai *RR-086. Note the very large inclusion (photo: Adam Stanford, Aerial Cam)*

Figure A3.62 below
Moai *RR-086. Differential weathering in different, adjacent facies of Rano Raraku tuff (photo: MST)*

Figure A3.63
Moai *RR-089 (known as Kokona Heroa) (photo: Adam Stanford, Aerial Cam)*

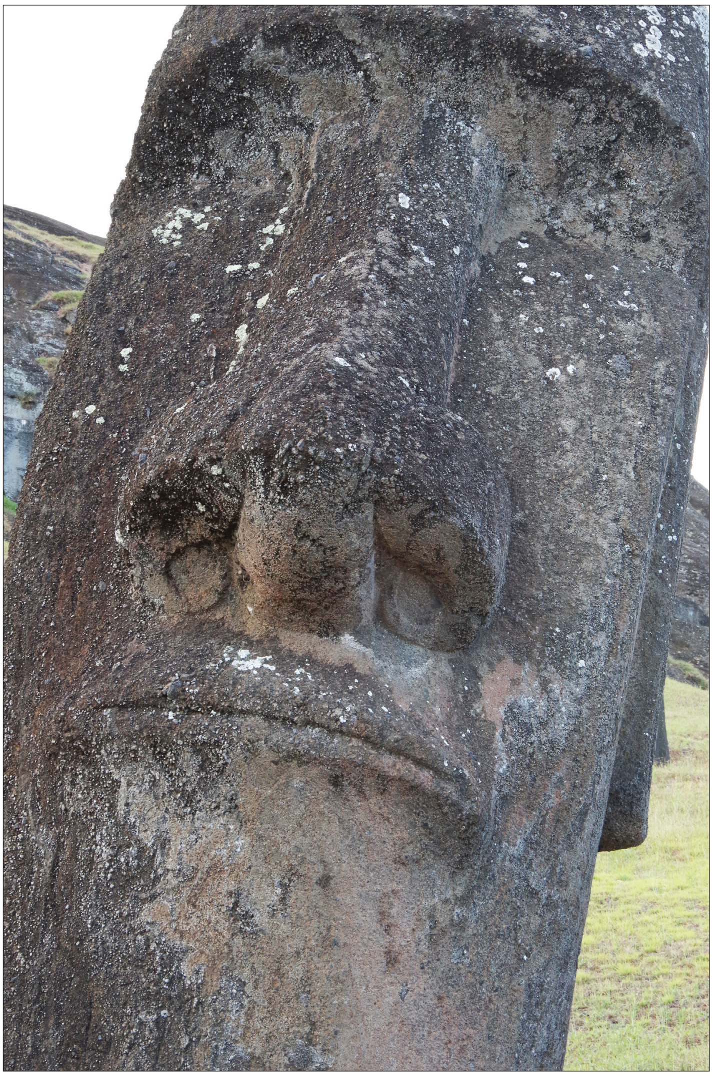

Figure A3.64
Moai *RR-089 showing differential weathering of left and right sides of face (photo: MST)*

Figure A3.65
Moai *RR-098 (known as Piro Piro) (photo: Adam Stanford, Aerial Cam)*

Figure A3.66
Moai *RR-098 Piro Piro. Detail of eyes (photo: MST)*

Figure A3.67
Moai *17-999 in front of Ahu Ava Raŋa Uka A Toroke Hau (photo: MST)*

Figure A3.68
Moai *17-999. Detail of left eye (photo: MST)*

Figure A3.69
Moai *05-217 on Ahu Mata Ketu (photo: MST)*

Figure A3.70
Moai *05-217. Detail of right eye (photo: MST)*

Figure A3.71
Moai *18-350 with Mauŋa Pui behind (photo: MST)*

Appendix 4: Rano Raraku tuff

Figure A4.1
Dressed, Rano Raraku tuff. Largely unweathered except for the (white) reprecipitated silica. 100% *(photo: MST)*

Figure A4.2
Heavily weathered Rano Raraku tuff. 100% *(photo: MST)*

Figure A4.3

Heavily weathered, recently damaged Rano Raraku tuff. 100% *(photo: MST)*